



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

HM31/1102

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APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/876,414	06/16/97	015	CHRISTIANSON, K	2813 11/02/98
First Named Applicant	WICKBOLDT, 35 USC 154(b) term ext. = 0 Days.			

TITLE OF INVENTION: POSITION OF DOPANT IMPURITIES AND PULSED ENERGY DRIVE-IN

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEES DUE	DATE DUE
0 LL-10092	438-535.000	L10	UTILITY	YES	\$660.00	02/02/99

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.  
PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS  
APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number.  
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

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Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
087876.414	06/16/97	WICKBOLDT	F IL-10092

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EXAMINER  
CHRISTIANSON,K

ART UNIT	PAPER NUMBER
2813	

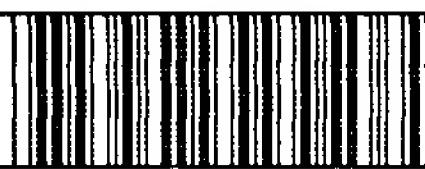
DATE MAILED: 11/02/98

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

## Notice of Allowability

Application No. <b>08/876,414</b>	Applicant(s) <b>Wickboldt et al.</b>
Examiner <b>Keith Christianson</b>	Group Art Unit <b>2813</b>



All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

This communication is responsive to telephone interview of 10/21/98.

The allowed claim(s) is/are 1, 2, 5-7, 9, 10, 12, and 14-20.

The drawings filed on \_\_\_\_\_ are acceptable.

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All    Some\*    None   of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

Applicant MUST submit NEW FORMAL DRAWINGS

because the originally filed drawings were declared by applicant to be informal.

including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 2.

including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

### Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

Interview Summary, PTO-413

Examiner's Amendment/Comment

Examiner's Comment Regarding Requirement for Deposit of Biological Material

Examiner's Statement of Reasons for Allowance

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## DETAILED ACTION

### *Examiner's Amendment*

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

#### Changes in the claims (amended claims #5/B, now entered):

In claim 1, line ~~7~~; claim 9, line ~~10~~ and claim 18, line ~~7~~ "10<sup>14</sup>" was replaced with --about 10<sup>15</sup>--.

Authorization for these changes were made by Mr. L. E. Carnahan in a telephone interview on October 21, 1998.

### *Specification*

2. Applicant's changes to the specification corrects the minor problems noted by the examiner in the Final Office Action and accordingly the objection to the specification is withdrawn.

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***Claim Rejections - 35 USC § 102***

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.
4. Applicant's amendment of claims 1 and 9 to include the subject matter of claims 3 and 4 and the subject matter of claims 11 and 13, respectively, makes the amended claims no longer anticipated by Narayan et al. and accordingly the 35 U.S.C. 102 based rejection is withdrawn.

***Claim Rejections - 35 USC § 103***

5. Applicant's amendment of claims 1 and 9 to include the subject matter of claims 2 and 3 and the subject matter of claims 11 and 13, respectively, makes the amended claims no longer anticipated by Narayan et al. and accordingly the 35 U.S.C. 103 based rejection is withdrawn.

***Discussion of Prior Art***

6. The ability to incorporate dopants into the surface of a semiconductor is important to many semiconductor processes. Prior art (e.g. Narayan et al.) describes techniques using pulsed energy procedures, but the prior art does not teach or describe a method for doping from a gaseous atmosphere using pulsed energy techniques which gives the previously unobtainable concentration of  $10^{15}$  electrically active dopant atoms per energy pulse.

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***Reasons for Allowance***

7. The following is an examiner's statement of reasons for allowance:

The prior art does not teach or describe the process as claimed for a doping process consisting of: depositing dopant on a surface of a material to be doped using a dopant atmosphere selected from the group consisting of BF<sub>3</sub>, PF<sub>3</sub>, AsH<sub>3</sub>, B<sub>2</sub>H<sub>6</sub>, PH<sub>3</sub>, AsH<sub>3</sub> and organometallics; and incorporating the dopant into the material by pulsed energy processing using pulsed energy selected from the group consisting of pulsed laser energy and pulsed ion-beam to produce a dose of about 10<sup>15</sup> cm<sup>-2</sup> electrically active dopant atoms per energy pulse.

***Conclusion***

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Christianson whose telephone number is (703) 305-4029. The examiner can normally be reached on Monday to Friday from 6:30 AM to 3:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Bowers, can be reached on (703) 308-2417. The fax phone number for this Group is (703) 305-3432.

KC

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October 31, 1998

*Charles D. Bowers Jr.*  
Charles Bowers  
Supervisory Patent Examiner  
Technology Center 2800